ABSTRACT OF THE DISCLOSURE

According to this invention, electrodes are formed on both sides of a part of an optical waveguide formed on a substrate and a voltage is applied between the electrodes to change the refractive index at the part of the optical waveguide where the electrode is formed. Therefore, the traveling direction of light can be changed. Moreover, an optical waveguide formed on a substrate, plural electrodes formed on both sides of the optical waveguide, plural incidence units formed at one end of the substrate, and plural emission units formed at the other end are provided. A voltage applied to an arbitrary electrode of the plural electrodes is controlled to change the refractive index at the part of the optical waveguide where the voltage is applied. Light emitted from an arbitrary incidence unit and incident on a core of the substrate thus becomes incident on an arbitrary emission unit. As the position of incidence of incident light or the diameter of the incident light is controlled to emit light to an arbitrary emission unit, an optical switch is realized that has a high degree of freedom in control, is small-sized, has no moving part and has high reliability. Moreover, as a voltage application unit is provided with an algorithm-based optimization processing function in order to improve the responsiveness and the degree of freedom of the optical switch, a highly flexible optical switch that can cope with, for example,

changes in communication quantity and communication failure, is realized.